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OBLON, SPIVAK, MCCLELLAND MAIER & NEUSTADT, P.C. 1940 DUKE STREET ALEXANDRIA, VA 22314			EXAMINER WANG, QUAN ZHEN	
			ART UNIT 2613	PAPER NUMBER
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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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<b>Office Action Summary</b>	<b>Application No.</b> 10/089,156	<b>Applicant(s)</b> MUNEHIRA ET AL.	
	<b>Examiner</b> QUAN-ZHEN WANG	<b>Art Unit</b> 2613	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 15 December 2008.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 15-19 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 15-19 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                     | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____  | 6) <input type="checkbox"/> Other: _____                          |

## **DETAILED ACTION**

### ***Continued Examination Under 37 CFR 1.114***

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 12/15/2008 has been entered.

### ***Drawings***

2. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the "amplification controller" must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate

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changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

***Claim Rejections - 35 USC § 112***

3. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

4. Claims 15-19 are rejected less than 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

Claim 15 recites the limitation "an amplification controller configured to modify a gain of at least one non- modulated spectrum slice optical signal component in order to maintain a predetermined overall gain profile of the non-modulated spectrum slice optical signal components when no signal is available for amplification for one of the non- modulated spectrum slice optical signal components". Nowhere did the

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specification as it was originally filed teaches cited limitation, Therefore, the cited limitation is considered as new matter. "Claim 17 is directed to corresponding methods for wavelength division multiplexing and optical transmission." Therefore, it is rejection by the same reason as applied to claim 15.

Claim 19 recites the limitation of "an amplification controlling means for modifying a gain of at least one non- modulated spectrum slice optical signal component in order to maintain a predetermined overall gain profile of the non-modulated spectrum slice optical signal components when no signal is available for amplification for one of the non- modulated spectrum slice optical signal components". Nowhere did the specification as it was originally filed teaches cited limitation, Therefore, the cited limitation is considered as new matter.

5. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

6. Claim 19 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 18 recites the limitation of "an amplification controlling means for modifying a gain of at least one non- modulated spectrum slice optical signal component in order to maintain a predetermined overall gain profile of the non-modulated spectrum slice optical signal components when no signal is available for amplification for one of the non- modulated spectrum slice optical signal components". However, the original

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specification does not disclose any structure of the corresponding “amplification controlling” apparatus. For a means-plus-function term that invokes 35 U.S.C. 112 sixth paragraph, “the scope of that claim limitation had to be defined by the structure disclosed in the specification plus any equivalents of that structure; in the absence of structure disclosed in the specification to perform those functions, the claim limitation would lack specificity, rendering the claim as a whole invalid for indefiniteness under 35 U.S.C. 112 second paragraph.” See *In re Donaldson*, 16 F.3d 1189, 1195 (Fed. Cir. 1994).

### ***Claim Rejections - 35 USC § 103***

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. Claims 15-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kerfoot et al. (U.S. Patent US 6,704,511 B1) in view of Ryu et al. (U.S. Patent US 6,330,384B1) and Cao (U.S. Patent US 6,731,877 B1), and further in view of Hamada (U.S. Patent US 5,703,711).

Regarding claims 15 and 17, and claim 19, as it is understood in view of the above 112 problem, Kerfoot discloses a wavelength division multiplexing and optical transmission apparatus (fig. 3), comprising:

an optical multiplexer (fig. 3, multiplexer 132) configured to transmit a multiplexed optical signal including a non-modulated spectrum slice optical signal (fig. 3, signals from dummy optical source 200) and a plurality of modulated optical signals (fig. 3, signals from transmitters 150);

a plurality of optical transmitting units (fig. 3, transmitters 150) configured to output the plurality of modulated optical signals to respective input ports of the optical multiplexer, each of the optical transmitting units configured to modulate a unique wavelength with a plurality of data signals and to output a respective modulated optical signal occupying a respective portion of a signal band; and

a dummy optical signal source device (fig. 3, dummy optical source 200) configured to generate the non-modulated spectrum slice optical signal, including:

an input optical amplifier with non input (column 3, lines 53-56) to generate an amplified spontaneous emission light signal,

a light dividing element (fig. 5, DEMUX 144) connected the output of the optical amplifier device and configured to output plural signals related to the amplified spontaneous emission light signal,

at least a first and second plurality of bandpass filters (fig. 5, the bandpass filters) having adjacent filter pass bands, each bandpass filter having a respective bandpass characteristic (inherent) and each arranged to receive a respective one of the plural signals output from the light dividing element and configured to output respective non- modulated

spectrum slice optical signal components (fig. 7, signals 182 and 184), a first non-modulated spectrum slice optical signal component being adjacent on a high side to the signal band, a second non-modulated spectrum slice optical signal component being adjacent on a low side to the signal band (fig. 7),

at least a first dummy signal optical multiplexer (fig. 5, MUX 146), each dummy signal optical multiplexer having inputs connected to outputs of the plurality of bandpass filters, respectively (fig. 7).

Kerfoot differs from the claimed invention in that Kerfoot does not specifically disclose that the dummy optical source comprising a second dummy signal multiplexer. However, it would have been obvious to one having ordinary skill in the art at the time the invention was made to incorporate a second dummy signal multiplexer in the system of Kerfoot, since it has been held that mere duplication of the essential working parts of a device involves only routine skill in the art. *St. Regis Paper Co. v. Bemis Co.*, 193 USPQ 8.

The modified system of Kerfoot differs from the claimed invention in that Kerfoot does not specifically disclose that the input optical amplifier having a signal input terminated without reflection. However, it is well known in the art to terminate an optical amplifier without reflection for a broad band amplified spontaneous emission light source. For example, Ryu teaches an optical amplifying means (fig. 3) for outputting an amplified spontaneous emission light signal including an optical amplifier having a signal input terminated without reflection (fig. 3, terminal end 50). Therefore, it would



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have been obvious for one of ordinary skill in the art at the time when the invention was made to use the termination concept of Ryu in the system of Kerfoot to configure the optical amplifying means including an optical amplifier having a signal input terminated without reflection. One of ordinary skill would be motivated to do so in order to avoid an undesired oscillation (Ryu, column 3, lines 18-24).

The modified system of Kerfoot and Ryu differs from the claimed invention in that Kerfoot and Ryu do not specifically disclose that the dummy optical signal source comprising: at least a first and second output optical amplifier, each having an input connected to an output of a respective one of the dummy signal optical multiplexer, and having respective outputs. However, Cao, from the same field of endeavor, teaches a concept of connecting an optical amplifier (i.e., fig. 4, amplifier 9) to a multiplexer (fig. 1, Amplifiers 24a and 24b). It is well recognized that an optical signal degrades as it travels through a transmission line or an optical component, and it is also well recognized that an optical amplifier could be used at any point of a communication system to restore signal strength of an optical signal, it would have been obvious for one of ordinary skill in the art at the time when the invention was made to incorporate optical amplifiers connecting to the first and second signal multiplexer in the modified system of Kerfoot and Ryu, as it is disclosed by Cao, in order to restore or boost the optical signal strength to a desired level.

The modified system of Kerfoot, Ryu, and Cao differs from the claimed invention in that Kerfoot, Ryu, and Cao do not specifically disclose an amplification controller configured to modify a gain of at least one non-modulated spectrum slice optical signal

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component in order to maintain a predetermined overall gain profile of the non-modulated spectrum slice optical signal components when no signal is available for amplification for one of the non-modulated spectrum slice optical signal components. However, using a controller to control an optical amplifier to set a gain to a predetermined profile is well known in the art. For example, Hamada discloses utilizing a controller to control an optical amplifier to modify the gain to a predetermined gain profile (abstract, column 2, lines 13-32, and figs. 1-6). Therefore, it would have been obvious for one of ordinary skill in the art at the time when the invention was made to incorporate a controller of Hamada into the modified system of Kerfoot, Ryu, and Cao. One of ordinary skill in the art would have been motivated to do so in order to provide a gain according to predetermined value (Hamada: abstract).

Regarding claims 16 and 18, the modified system of Kerfoot, Ryu, and Cao differs from the claimed invention in that Kerfoot, Ryu, and Cao do not disclose that the dummy optical signal source device in the system further comprising:

- a third, fourth and fifth plurality of bandpass filters having adjacent filter pass bands, and arrange to receive respective ones of the plural signals output from the light dividing element,

- a third, fourth and fifth dummy signal optical multiplexer connected to a respective one of the third, fourth and fifth plurality of bandpass filters,

- a third, fourth and fifth output optical amplifier connected to a respective one of the third, fourth and fifth dummy signal optical multiplexer, the third and fifth output optical amplifier configured to amplify

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at a heightened amplification level when the fourth output optical amplifier does not output a corresponding non-modulated spectrum slice optical signal so as to maintain a predetermined overall gain profile of the non-modulated spectrum slice optical signals input to the dummy signal optical multiplexer.

However, these limitations are further duplications of the essential working parts of the modified system of Kerfoot, Ryu, and Cao. Therefore, it would have been obvious for one of ordinary skill in the art at the time when the invention was made to configure the dummy optical signal source device in the system further including:

a third, fourth and fifth plurality of bandpass filters having adjacent filter pass bands, and arrange to receive respective ones of the plural signals output from the light dividing element,

a third, fourth and fifth dummy signal optical multiplexer connected to a respective one of the third, fourth and fifth plurality of bandpass filters,

a third, fourth and fifth output optical amplifier connected to a respective one of the third, fourth and fifth dummy signal optical multiplexer, the third and fifth output optical amplifier configured to amplify at a heightened amplification level when the fourth output optical amplifier does not output a corresponding non-modulated spectrum slice optical signal so as to maintain a predetermined overall gain profile of the non-modulated spectrum slice optical signals input to the dummy signal optical multiplexer;

since it has been held that mere duplication of the essential working parts of a device involves only routine skill in the art. *St. Regis Paper Co. v. Bemis Co.*, 193 USPQ 8.

### ***Response to Arguments***

9. Applicant's arguments with respect to claim 19 filed on 12/15/2008 have been considered but are moot in view of the new ground(s) of rejection.

10. Applicant's other arguments filed on 12/15/2008 have been fully considered but are not persuasive.

Applicant argues, "The cited Kerfoot, Ryu and Cao references clearly do not describe or suggest the recited amplification controlling means. Further, although the Hamada reference describes an amplifier which has feedback control, Hamada does not describe or render obvious an amplification controlling means for modifying a gain of at least one non-modulated spectrum slice optical signal component in order to maintain a predetermined overall gain profile of the non-modulated spectrum slice optical signal components when no signal is available for amplification for one of the non-modulated spectrum slice optical signal components." However, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986). For the instant case, the combination of prior art references as a whole teaches each and every claimed limitation in the claims. Furthermore, any one of ordinary skill in the art understands that an optical amplifier is transparent to the data and data rates carried by the optical

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signals being amplified. In other words, it is a common knowledge that an optical amplifier would amplify a non-modulated optical signal in the same way as it amplifies optical signals modulated with data of any data rates. Therefore, the combination of the cited references clearly and undoubtedly reads the claims.

Applicant argues, "Action mailed November 18, 2008, Kerfoot, Ryu and Cao do not describe or suggest an amplification controller configured to modify a gain of at least one non-modulated spectrum slice optical signal component in order to maintain a predetermined overall gain profile of the non-modulated spectrum slice optical signal components when no signal is available for amplification for one of the non-modulated spectrum slice optical signal components, as is recited in Claim 15. ... Initially, Applicants note that the amplification controller feature recited in Claim 15 is not equivalent to what is asserted by the Advisory Action as being "well known in the art." For instance, the claimed amplification controller is configured to modify a gain of at least one non-modulated spectrum slice optical signal component in order to maintain a predetermined overall gain profile of the non-modulated spectrum slice optical signal components when no signal is available for amplification for one of the non-modulated spectrum slice optical signal components. This feature is not equivalent to controlling an optical amplifier to set a gain to some generic predetermined profile." However, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986). For the instant case, the combination of prior art references as a whole teaches

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each and every claimed limitation in the claims. Furthermore, any one of ordinary skill in the art understands that an optical amplifier is transparent to the data and data rates carried by the optical signals being amplified. In other words, it is a common knowledge that an optical amplifier would amplify a non-modulated optical signal in the same way as it amplifies optical signals modulated with data of any data rates. Therefore, the combination of the cited references clearly and undoubtedly reads the claims.

Applicant further argues, "In the present case there has been provided no reason why the combination of Kerfoot, Ryu, Cao and Hamada should be modified in order to meet the features of the claimed invention. Moreover, Applicants note that one skilled in the art using the combination of Kerfoot, Ryu, Cao and Hamada would have not had a reason to make this modification." The examiner recognizes that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988) and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). In this case, Cao clearly and specifically teaches that amplifiers 24a -24x are used to amplify an "overall frequency band signal to a predetermined level" (column 7, lines 1-6. While Hamada specifically discloses utilizing a controller to control an optical amplifier to modify the gain to a predetermined gain profile (abstract, column 2, lines 13-32, figs. 1-6). Therefore, it would have been obvious for one of ordinary skill in the art at the time when the invention was made to incorporate a controller of Hamada into the modified

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system of Kerfoot, Ryu, and Cao. One of ordinary skill in the art would have been motivated to do so in order to provide a gain according to predetermined value (Hamada: abstract and Cao: column 7, lines 1-6).

### ***Conclusion***

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Quan-Zhen Wang whose telephone number is (571) 272-3114. The examiner can normally be reached on 9:00 AM - 5:00 PM, Monday - Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jason Chan can be reached on (571) 272-3022. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

12/18/2008

/Quan-Zhen Wang/  
Examiner, Art Unit 2613